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(54) **Improved tooth-brush with interchangeable head**

Verbesserte Zahnbürste mit auswechselbarem Kopf

Brosse à dents améliorée à tête interchangeable

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US-A- 5 555 590

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EP 0 870 440 B1

Description

[0001] The present invention concerns a tooth-brush, particularly a tooth-brush with an interchangeable bristle carrier.

[0002] As known, the tooth-brush portion most subject to wear, which thus determines the life of the tooth-brush, is the head portion carrying the bristles, which form the active part in the teeth cleaning process.

[0003] Tooth-brushes wherein the bristle carrier is interchangeable have spread on the market since quite some time: they allow a wide flexibility of use, a saving of costs for the consumer, and a minimum impact on the environment. The interchangeable bristle carrier can in fact be produced and sold separately from the tooth-brush stick, allowing the consumer to purchase the type of bristle carrier which suits him best (for the characteristics of the bristles, such as softness, length, colour, etc.) and, above all, to keep for a long time the tooth-brush stick - which is the most expensive component and the largest one as far as disposal - and replace only the bristle carrier when the bristles have worn out.

[0004] To facilitate replacing the bristle carrier, it should be possible to easily insert it into the head of the tooth-brush stick but, at the same time, the connection between these two elements should be steady, so as to prevent any accidental disconnection. The possibility for the bristle carrier to disengage from the tooth-brush head involves a very serious drawback, as it normally happens while the tooth-brush is being used and, in this case, the head of the stick without the bristle carrier would form a blunt instrument apt to injure the gums of the consumer.

[0005] Consequently, the interchangeable bristle carrier normally consists of a block, carrying bristles projecting from the front side and a tang projecting from the rear side, said tang being fitted into a suitable housing formed into the head of the tooth-brush stick.

[0006] To the interchangeable bristle carrier there are preferably associated antirotation means, to prevent said carrier from rotating about the longitudinal axis of the tang in the event that its housing should be of circular shape. Alternatively, the cross section of the tang could be conceived so as not to have an axially symmetrical shape, but for example an elliptical shape.

[0007] Furthermore, to ensure a steady engagement, the tang of the bristle carrier is normally fitted, with a transition fit, into a corresponding hole formed into the head of the tooth-brush stick. Said hole, having to guide and retain the tang, should be sufficiently deep and thus cross the head of the tooth-brush stick throughout its thickness.

[0008] Tooth-brushes of the type described heretofore are known, for example, from US-A-5396679, US-A-555590 and GB-A-2088710.

[0009] The above solution involves however some drawbacks. To start with, if one does not keep to the nominal measures with extreme precision, the tang is

likely to project for a very short length from the through hole at the head of the tooth-brush, thereby forming a small step interrupting the continuity of the outer surface of said head. This slight step, in spite of its minimum size, forms a potential weapon for the soft fleshy parts of the mouth cavity of the user who, unless using the tooth-brush with extreme caution, is likely to get seriously hurt or wounded.

[0010] But even if the engagement between the two above elements should be optimal - which means that the tang, once fitted into its housing hole, ends in line with the outer surface of the tooth-brush head - there is still an even slight cleft between the two coupling surfaces of the tang and hole, which remains exposed to the surrounding environment and thus forms an ideal seat for housing dirt and bacteria which are difficult to remove.

[0011] In US 4890349 an interchangeable tooth-brush is illustrated in which, to obtain the ejection of the carrier it is employed, in one bristle carrier embodiment, the back of the housing of the carrier having a very thin flexible wall and, in another embodiment, a mobile button articulated through a bellows-like connection.

[0012] In WO97/49315 a prior art under art. 54(3) EPC, is disclosed and shows interchangeable Bristle carrier tooth-brush which has a disc-shape button, of very high flexible material (as elastomer), fitted in a head introduction hole for a tongue of the interchangeable carrier. This button is fixed to the internal walls of the hole from the back of the housing and covers said through hole and the end of the tang of the interchangeable bristle carrier.

[0013] The object of the present invention is to overcome the above draw-backs, by supplying a tooth-brush with an interchangeable bristle carrier - consisting of a block into which is inserted a plurality of cleaning bristles and from which projects a tang to be fitted into a through hole formed into a housing at the head of the tooth-brush stick - wherein the outer surface of said housing is covered, with a layer of soft and elastic material, said layer is a coating layer, which is separate from said bristle carrier and which is applied to and extending over at least the whole back surface of said housing, thereby covering said through hole and said end of the tang.

[0014] Further characteristics and advantages of the tooth-brush according to the present invention will anyhow be more evident from the following detailed description, given by way of example and illustrated on the accompanying drawings, in which:

Fig. 1 is a partially exploded perspective view of the tooth-brush according to the present invention;

Fig. 2 is an exploded view of the tooth-brush head and of the bristle carrier, forming part of the tooth-brush shown in fig. 1;

Fig. 2A is a cross section view of the housing in the tooth-brush head; and

Fig. 3 is a side elevation view of the tooth-brush,

with the interchangeable bristle carrier fitted therein.

[0015] According to the present invention - as shown on the drawings - a tooth-brush stick 1 consists of a handle 1a and of a neck 1b terminating, at its head, with a housing 2 for an interchangeable bristle carrier 3.

[0016] The interchangeable bristle carrier 3 consists of a block 3a into which is inserted a plurality of bristles 3b, a coupling tang 3c projecting from the side of the block opposite to that carrying the bristles. The bristle carrier 3 is inserted with a tight fit into said housing 2, by engagement of the tang 3c into a corresponding hole 2a formed into the bottom surface 2b of said housing 2. The hole 2a, and thus the cross section area of the tang 3c, can be of any shape, for example - as mentioned above - of elliptical shape.

[0017] The hole 2a crosses the bottom surface 2b of the housing 2 throughout its thickness. The length of the tang 3c is such that it entirely engages into the hole 2a and, eventually, slightly emerges from the back 2c of the housing 2 (as shown in fig. 3), thereby improving the overall restraint of the bristle carrier 3 into the housing 2.

[0018] According to the invention, the whole outer surface of the housing 2 is covered, including the area around and comprising the hole 2a, with a coating layer 4 of soft and elastic material consisting, for example, of a membrane of rubber or elastomeric material (SEBS type synthetic rubber, and the like). Said membrane 4 is arranged to cover the back 2c and the through hole 2a, so as to thereby cover also the end of the tang 3c.

[0019] Preferably, the membrane 4 is apt to cover not only the back 2c of the housing 2, but also the remaining part of its outer surface, and even a small portion of the neck 1b.

[0020] The membrane 4 anyhow allows the end of the tang 3c to partially project out of the hole 2a, while yielding under the pressure of said tang; it thus simultaneously forms a smooth and radiusing surface, apt to eliminate any sharp corners which may injure the mouth cavity. It thereby fully overcomes a first drawback of known technique.

[0021] Furthermore, the presence of the membrane 4 allows to avoid any direct exposure of the backside 2c - and particularly of the coupling surfaces of the tang 3c and hole 2a - to the surrounding environment, thereby preventing the possible gathering of dirt, and achieving also the second object of the invention.

[0022] It is anyhow understood that the protection scope of the present invention is not limited to the particular configuration described heretofore, but may cover any other technically equivalent constructive variants within the scope of the appended claims.

[0023] For example, although the above description and drawings have always referred to an elliptical arrangement of the bristles, it is equally possible to adopt also other arrangements, without thereby departing from the protection scope of the present invention.

Claims

1. A tooth-brush with an interchangeable bristle carrier (3) consisting of a block (3a) within which is inserted a plurality of cleaning bristles (3b) and from which projects a tang (3c) to be fitted into a through hole (2a) formed into a housing (2) at the head of the tooth-brush stick (1), the through hole (2a) being closed by a layer (4) of soft and elastic material, wherein said layer (4) is a coating layer which is separate from said bristle carrier (3) and which is applied to and extending over at least the whole back surface (2c) of said housing (2), thereby covering said through hole (2a) and said end of said tang (3c).
2. Tooth-brush as in claim 1), wherein said material is rubber or its derivatives.
3. Tooth-brush as in claim 1), wherein said material is elastomer of the SEBS type, or the like.
4. Tooth-brush as in any one of the previous claims, wherein said through hole (2a) and said tang (3c) have an elliptical shape.

Patentansprüche

1. Eine Zahnbürste mit einem auswechselbaren Borstenträger (3), der aus einem Block (3a) besteht, in den mehrere Reinigungsborsten (3b) eingesetzt sind und von dem ein Zapfen (3c) vorragt, der in ein in einem Gehäuse (2) am Kopf des Zahnbürstenstiels (1) ausgebildetes Durchgangsloch (2a) einzusetzen ist, wobei das Durchgangsloch (2a) von einer Schicht (4) aus weichem und elastischem Material verschlossen ist, worin die Schicht (4) eine Deckschicht ist, die separat von dem Borstenträger (3) ist und auf wenigstens der gesamten Rückfläche (2c) des Gehäuses (2) aufgebracht ist und sich darüber erstreckt, wodurch sie das Durchgangsloch (2a) und das Ende des Zapfens (3c) abdeckt.
2. Zahnbürste nach Anspruch 1, **dadurch gekennzeichnet, daß** das Material Gummi oder Derivate davon ist.
3. Zahnbürste nach Anspruch 1, **dadurch gekennzeichnet, daß** das Material Elastomer vom SEBS-Typ oder dergleichen ist.
4. Zahnbürste nach irgendeinem der vorangehenden Ansprüche, **dadurch gekennzeichnet, daß** das Durchgangsloch (2a) und der Zapfen (3c) eine elliptische Gestalt aufweisen.

Revendications

1. Brosse à dents avec support de soies interchangeables (3) consistant en un bloc (3a) au sein duquel est insérée une pluralité de soies de nettoyage (3b) et d'où se projette un appendice (3c) destiné à être emboîté dans un trou traversant (2a) ménagé dans un logement (2) à la tête de la tige de brosse à dents (1), le trou traversant (2a) étant fermé par une couche (4) d'un matériau élastomère tendre et élastique, dans laquelle ladite couche (4) est une couche de revêtement qui est distincte dudit support de soies (3) et qui est appliquée et s'étend sur au moins la totalité de la surface arrière (2c) dudit logement (2), de manière à recouvrir ledit trou traversant (2a) et ladite extrémité dudit appendice (3c).

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2. Brosse à dents selon la revendication 1, dans laquelle ledit matériau est un caoutchouc ou ses dérivés.

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3. Brosse à dents selon la revendication 1, dans laquelle ledit matériau est un élastomère du type SEBS, ou analogue.

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4. Brosse à dents selon l'une quelconque des revendications précédentes, dans laquelle ledit trou traversant (2a) et ledit appendice (3c) ont une forme elliptique.

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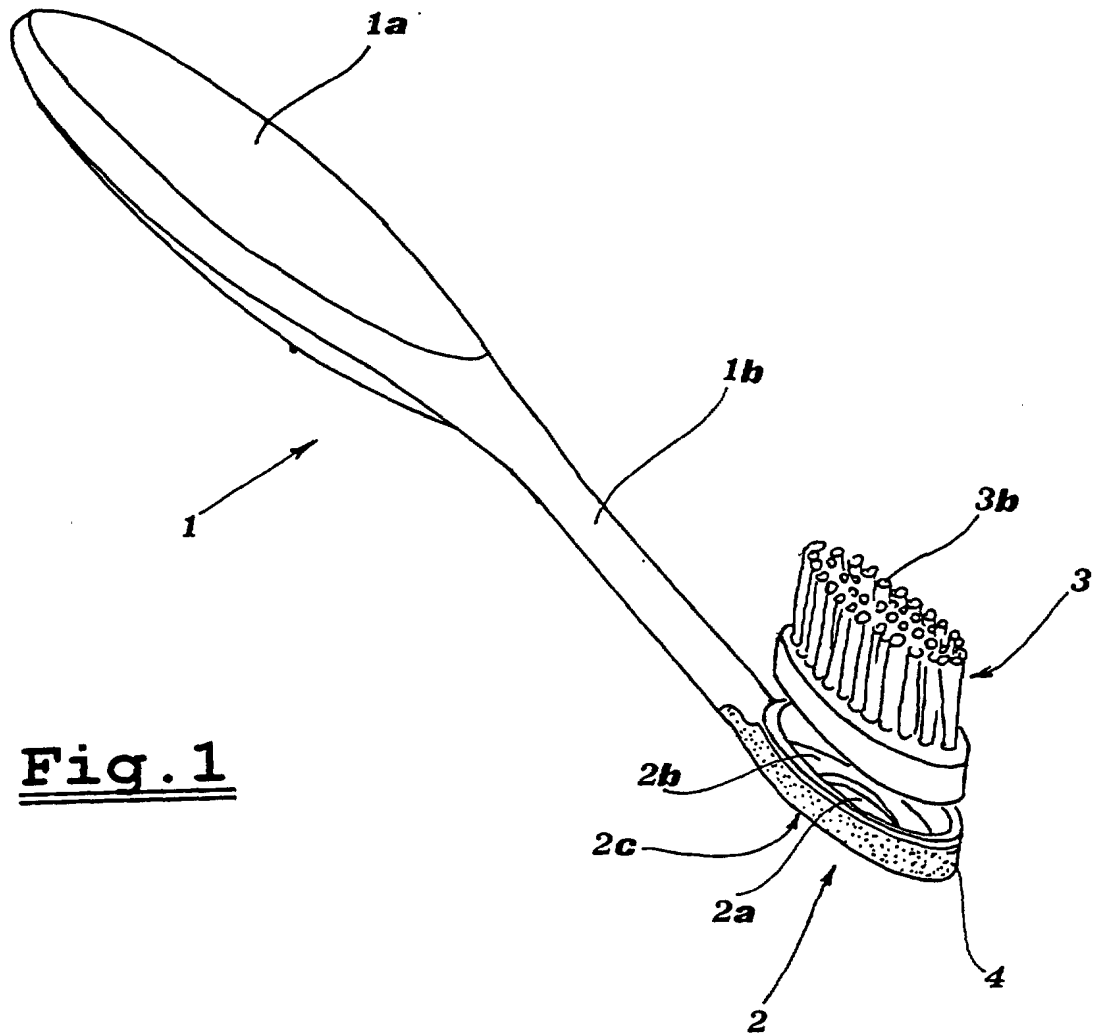


Fig. 1

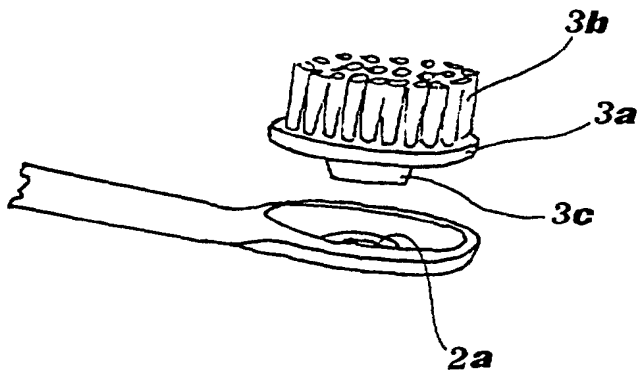


Fig. 2

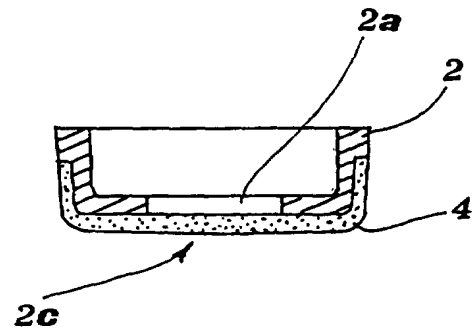


Fig. 2A

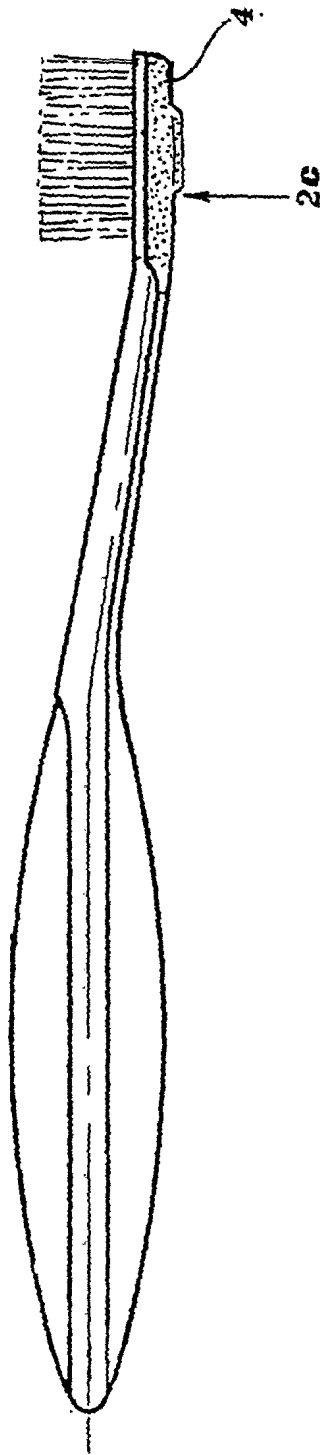


Fig. 3